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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/620,910	07/15/2003	David Champion	200208821-1	8961

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INTELLECTUAL PROPERTY ADMINISTRATION  
FORT COLLINS, CO 80527-2400

EXAMINER
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LEE, CYNTHIA K

ART UNIT	PAPER NUMBER
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1745

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/23/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/620,910

Applicant(s)

CHAMPION, DAVID

Examiner

Cynthia Lee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 26 December 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-4, 6-19, 21-23 and 43-45 is/are pending in the application.
- 4a) Of the above claim(s) 3, 4, 17, 43 and 45 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 6-16, 18, 19, 21-23 and 44 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 2/28/2007.

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

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### **DETAILED ACTION**

This Office Action is responsive to the amendment filed on 6/13/2006. Claims 1-4, 6-19, 21-23, and 43-45 are pending. Claims 3, 4, 17, 43, and 45 are withdrawn from further consideration as being drawn to a non-elected invention.

Applicant's prior art arguments have been considered, but are not persuasive. Thus, claims 1, 2, 6-16, 18, 19, 21-23, and 44 are finally rejected.

### ***Election/Restrictions***

Newly submitted claim 45 is directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: Claim 45 is directed to a distinct species as disclosed in figure 15. The Examiner inadvertently examined claim 43 in the previous Office Action and also notes that claim 43 is also drawn to a distinct species as disclosed in figure 15.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 43 and 45 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

### ***Claim Rejections - 35 USC § 101***

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

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Claims 1, 2, 6-13 are rejected under 35 U.S.C. 101 because the claimed invention is not supported by either a substantial asserted utility or a well-established utility.

The fuel cell assembly has operability for a wherein an empty space for a fuel path extends from an anode to another anode, but not for an anode to a cathode. It is noted that when a fuel gas and an oxidant gas mix, it is well-known that combustion occurs, and does not generate electricity to make the fuel cell operable.

Claims 1, 2, 6-13 are also rejected under 35 U.S.C. 112, first paragraph. Specifically, since the claimed invention is not supported by either a substantial asserted utility or a well established utility for the reasons set forth above, one skilled in the art clearly would not know how to use the claimed invention.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1, 2, 6-13 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for an anode to anode space, does not reasonably provide enablement for a cathode to anode space. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to use the invention commensurate in scope with these claims.

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For example, refer to Holmes (US 2002/0110716). Electricity is generated within solid oxide fuel cell tubes. Oxidant gas enter the oxidant feed tubes and enter a series of hollow fuel cell tubes and contact the cathode for reaction. Fuel enter from the bottom of the generator and passes outside of the fuel cells to contact the exterior fuel electrode. Spent fuel and oxidant gas is mixed in the combustion chamber 94 to eliminate spent gas and provide heat for the incoming oxidant. Refer to Fig 2 and [0016].

With respect to enablement commensurate in scope with the claims, section 2164.08 of the MPEP states:

"The Federal Circuit has repeatedly held that 'the specification must teach those skilled in the art how to make and use the full scope of the claimed invention without undue experimentation'. In re Wright, 999 F.2d 1557, 1561, 27 USPQ2d 1510, 1513 (Fed. Cir. 1993)... The determination of the propriety of a rejection based upon the scope of a claim relative to the scope of the enablement involves two stages of inquiry. The first is to determine how broad the claim is with respect to the disclosure. The entire claim must be considered. The second inquiry is to determine if one skilled in the art is enabled to make and use the entire scope of the claimed invention without undue experimentation."

Factors to be considered when determining whether the claimed invention would require undue experimentation are given in MPEP 2164.01 (a). In re Wands, 858 F. 2d 731, 737; 8 USPQ 2d 1400, 1404 (Fed. Cir. 1988). Only the relevant factors will be addressed for determining undue experimentation of the presently claimed invention.

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The relevant factors are (A) the breadth of the claims; (B) the amount of direction provided by the inventor; (C) the existence of working examples

**Factor (A) Breadth of the claims:**

The fuel cell assembly has operability for a wherein an empty space for a fuel path extends from an anode to another anode, but not for an anode to a cathode. It is noted that when a fuel gas and an oxidant gas mix, it is well-known that combustion occurs, and does not generate electricity to make the fuel cell operable. Thus, claim 1 is enabling for an anode to anode space, does not reasonably provide enablement for a cathode to anode space

**Factor (B) The amount of direction provided by the inventor.**

Applicants have not provided any direction as to how a fuel cell can operate when an empty space for a fuel path extends from an anode to a cathode. This configuration would render the fuel cell inoperable for reasons provided above.

**Factor (C) The existence of working examples:**

It is noted that when a fuel gas and an oxidant gas mix, it is well-known that combustion occurs, and does not generate electricity to make the fuel cell operable. Applicants have not demonstrated any working examples or data to disprove this well-known phenomena.

.....

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 2, 6-13, 44 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The limitation "an electrode surface to a radially spaced electrode surface" in claim 1 is unclear. Do these electrodes refer back to the aforementioned electrodes, anode electrode and a cathode electrode?

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 14-16, 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Montemayor (US 6063517).

Montemayor discloses a spiral-shaped fuel cell assembly with an outer casing. The MEA is wound several times to form a spiral bundle from the periphery of the housing to the center. The reactant path follows the spiral bundle that extends around the perimeter. The hydrogen gas enters and exits from the hydrogen injection tubes located in the periphery and the center of the fuel cell assembly. The MEA winds around the hydrogen injection tube 24 (fig. 2) at least once around the perimeter. The oxidant inlet is also associated with the outer region. (See fig. 2 and 3 and 2:25-39 and

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5:13-45) The fuel path is adjacent to the anode. Refer to Fig. 1. The catalyst layer 16 is adjacent to the anode layer 14 and thus, the catalyst layer meets the claim limitation "unobstructed gap."

Montemayor discloses that the anode/cathode arrangement has a spiral shape that extends more than once around the perimeter of the exhaust region and defines a reactant having an outlet end associated with the exhaust region and an inlet end. The Office is interpreting the arrow below the arrow 22 in Fig. 3 as the exhaust region and thus, all of the byproducts and any unused reactants that exit the fuel cell assembly exit by way of the inner region (applicant's claim 19).

Regarding claims 14-16 and 18, the exhaust region defines a perimeter (tube 24). The spiral assembly extends outwardly of and more than once around the perimeter of the exhaust region. The reactant path has an outlet/ associated with the exhaust region and an inlet end. The spiral assembly comprises an anode, a cathode and an electrolyte. See fig. 2 and 3.

Regarding claim 14, Montemayor's reactant flows both labeled 34, as well as 22 and 24, meet the limitation "only reactant flow direction is inward toward the housing exhaust port that is located radially inward of the housing inlet". Since Montemayor's housing exhaust port is located radially inward of the housing inlet, all the reactant flows ultimately lead toward the housing exhaust and thus, necessarily flow only inward toward the housing exhaust port.

***Claim Rejections - 35 USC § 102/103***



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The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 19, 22, 23 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Montemayor (US 6063517).

Montemayor discloses that the anode/cathode arrangement has a spiral shape that extends more than once around the perimeter of the exhaust region and defines a reactant having an outlet end associated with the exhaust region and an inlet end. The Office is interpreting the arrow below the arrow 22 in Fig. 3 as the exhaust region and thus, all of the byproducts and any unused reactants that exit the fuel cell assembly exit by way of the inner region.

Montemayor discloses that hydrogen and oxygen are supplied into the hydrogen tubes and the oxygen path. Further, an air or oxygen blower is present to inject the reactant gases. Although Montemayor does not expressly disclose a reactant supply connected to the reactant inlets (applicant's claim 23), a reactant supply must necessarily be present for the hydrogen gas to be flowing through the hydrogen tubes. Should it not be anticipatory, it would have been obvious to one of ordinary skill in the

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art at the time the invention was made to provide a reactant supply for the benefit of providing reactant gas to the fuel cell to make the fuel cell operable.

The Examiner notes that Montemayor as disclosed in Fig. 3 meets the limitation "such that all of the byproducts and any unused reactants that exit the fuel cell assembly exit by way of the inner region". The Examiner notes that Montemayor's configuration is functionally equivalent to Applicant's fuel cell assembly as claimed in claim 19.

The Examiner makes a *prima facie* case of equivalence. Factors to be considered are:

- (A) performs the function specified in the claim,
- (B) is not excluded by any explicit definition provided in the specification for an equivalent, and
- (C) is an equivalent of the means- (or step-) plus-function limitation,

Before addressing the factors establishing equivalence, the Examiner notes that the Specification discloses several distinct embodiments, as supported by the Restriction requirement dated 12/9/2005. The Applicants have not specified in the Specification as to which embodiment the means-plus-function refers to. Furthermore, the Applicants have not excluded any definitions that would exclude any structures.

MPEP 2184 I states that:

If no definition is provided, some judgment must be exercised in determining the scope of "equivalents." Generally, an "equivalent" is interpreted as embracing more than the specific elements described in the specification for performing the specified function, but less than any element that performs the function specified in the claim.

The Examiner notes that solely the drawing cannot be relied upon to exclude limitations, absent specific definitions supported by the Specification.

In light of the above comments, the following factors are addressed:

**Addressing factor A**

Montemayor's outlet reactants all exit by the inner region, as claimed by the Applicants. The Examiner notes that Montemayor's exit flows performs the identical function specified in claim 19 in substantially the same way, and produces substantially the same results, in that all the reactant flow ultimately exits by the way of the inner region.

Prior art is an equivalent if "the prior art element performs the identical function specified in the claim in substantially the same way, and produces substantially the same results as the corresponding element disclosed in the specification. *Kemco Sales, Inc. v. Control Papers Co.*, 208 F.3d 1352, 54 USPQ2d 1308 (Fed. Cir. 2000)

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**Addressing factor B**

The Examiner notes that a person of ordinary skill in the art would have recognized the interchangeability between Montemayor and the Applicant's invention because it does not affect the reactant flow path. The only difference between Montemayor and the Applicant's invention is that in Montemayor, the reactant exits at two locations and Applicant's reactant exits at one location at the inner assembly once the reaction has been completed. Either configuration would allow for the reactant to exit at the inner assembly.

**Addressing factor C**

The Examiner notes that prior art is an equivalent if "(t)he limitation in a means-plus-function claim is the overall structure corresponding to the claimed function. The individual components of an overall structure that corresponds to the claimed function are not claim limitations. Also, potential advantages of a structure that do not relate to the claimed function should not be considered in an equivalents determination under 35 U.S.C. 112, sixth paragraph).

**Addressing factor D**

This factor has been addressed by factors (A)-(C).

Should Montemayor not be anticipatory, the Examiner notes that it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the reactant outlet to solely the inner region for the benefit of simplifying the reactant exit flow.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Montemayor (US 6063517) as applied to claims 1 and 20 above and incorporated herein, in view of Wattelet (US 2003/0011721).

Montemayor discloses all the limitations of claim 20. Although Montemayor does not disclose a heat exchanger associated with the housing and connected to the exhaust port, Wattelet discloses a fuel cell with an integrated heat exchanger unit. The integrated heat exchanger unit exchanges heat with the air outlet to cool the fuel cell ([0008] and fig. 1). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to add an integrated heat exchanger unit to the cathode exhaust for the benefit of cooling the fuel cell.

### ***Response to Arguments***

Applicant's arguments to prior art Montemayor have been fully considered but they are not persuasive.

*Applicant asserts that there is some flow in Montemayor that does not flow toward a housing exhaust port that is located radially inward of the housing inlet.*

The Examiner disagrees. The Applicant has specified the location of the exhaust, but has not specified what is meant by "inward". Since Montemayor's housing exhaust port is located radially inward of the housing inlet, all the reactant flows ultimately lead toward the housing exhaust and thus, necessarily flow only inward toward the housing exhaust port.

Arguments on claims 19 and 21-23

The Examiner has established a prima facie case of equivalence as stated above.

**Conclusion**

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the

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shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cynthia Lee whose telephone number is 571-272-8699. The examiner can normally be reached on Monday-Friday 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's trainer, Susy Tsang-Foster can be reached on 571-272-1293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ckl

Cynthia Lee

  
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PRIMARY EXAMINER